

SITE NEED STATEMENT

General Reference Information

Need Title: Soil Volume Reduction
Need Code: NV04-0101-05S
Need Summary: A technology is needed to reduce the volume of contaminated soil at soil sites. This may involve segregation of soils contaminated above a to be determined corrective action level or the treatment of soils to remove or separate contaminants thereby reducing the volume of waste to be transported and disposed.
Origination Date: January 1, 2001
Need Type: Science and Technology Need
Operations Office: DOE/NV
Geographic Site Name: Nevada Test Site, Tonopah Test Range, Nellis Air Force Range
Project: NV211/Soils
National Priority: Medium
Operations Office Priority: 5 of 12

Problem Description Information

Operations Office Program Description: The DOE/NV Environmental Restoration Program encompasses activities that assess the degree of contamination resulting from the testing program at the Nevada Test Site, the Nellis Air Force Range, the Tonopah Test Range, and eight offsite locations, and performs actions required by federal and state regulations. The objects of the Program are to: (1) identify the nature and extent of the contamination, (2) determine its potential risk to the public and the environment, and (3) perform the necessary corrective actions in compliance with applicable regulatory guidelines and requirements.

Need/Problem Description: A technology is needed to reduce the volume of contaminated soil at soil sites. This may involve segregation of soils contaminated above a to be determined corrective action level or the treatment of soils to remove or separate contaminants thereby reducing the volume of waste to be transported and disposed.

Functional Performance Requirements:

- Clean soil plutonium concentration less than 1000 pCi/g
- Technology capable of treating wide variety of soils varying in composition and other characteristics
- Soil processing throughput maximized to minimize costly time in the field
- Significant soil volume reduction, at least 70%
- Portable technology that operates effectively and with low maintenance in remote, arid environments
- Water consumption minimized by recycling or other means. Water consumption for dust control minimized by equipment design or operation
- Secondary waste generation, and dust and airborne contaminants production minimized; mixed waste or transuranic waste production is unacceptable.

Definition of Solution: Soil sites remediated to meet regulatory requirements at a life-cycle cost that is significantly less than the known baseline cost, with no significant adverse environmental, safety or health impacts from deploying the innovative technology.

Targeted Focus Area: Subsurface Contaminants

Potential Benefits: Substantial cost savings because of reduce volumes of contaminated soil being transported and disposed at the NTS. Potential reduced risk to workers because of lower contaminated soil volumes being handled and to the environment because of fewer truck shipments of contaminated soil.

Potential Cost Savings: Implementing the technology will result in an estimated cost savings of \$33 million
Potential Cost Savings Narrative: The baseline project cost was reviewed to identify cost elements that would be impacted by a generic soil volume technology. These elements were then adjusted for an assumed 70 percent reduction in contaminated soil being managed. The cost of deploying the generic technology was estimated based on past experience. The total adjusted cost was then calculated. The difference between the baseline and the adjusted cost is the cost savings.

Technical Basis: The existing technology results in large volumes of waste that require disposal.

Cultural/Stakeholder Risks associated with transportation on public roads will be reduced since the

Basis:	reduction in waste volumes will decrease the number of waste shipments to the NTS.
Environment, Safety, and Health Basis:	A reduction in the volume of waste generated during cleanup would reduce the physical risks to the public during transportation of waste to the disposal site, minimize the volume of waste (pollution prevention), and reduce the occupational and exposure risk to site workers.
Regulatory Drivers:	Corrective action levels are currently being negotiated with the Nevada Division of Environmental Protection and the U.S. Air Force. Soil volumes will depend upon the corrective action level set through negotiations and techniques/technology used in reducing the volume of waste generated during cleanup to the corrective action level.
Milestones:	Not applicable
Material Streams:	LLW contaminated soils (1026). Technical risk score 3. Not on critical path to closure
TSD System:	Volume reduction (1639)
Major Contaminants:	Plutonium, depleted uranium, tritium, and other radionuclides
Contaminated Media:	Surface and subsurface soil
Volume/Size of Contaminated Media:	111,000 cubic meters
Earliest Date Required:	FY 2007
Latest Date Required:	FY 2007

Baseline Technology Information

Baseline Technology Process:	Currently, soils are excavated using construction earth moving equipment to approximate depths.
Life-Cycle Cost Using Baseline:	Approximately \$115,000 million
Uncertainty on Baseline Life-Cycle Cost:	The ER baseline planning assumption for soils is to characterize the area to be remediated, scrape and excavate the area as needed to remove surface soil exceeding the corrective action level, characterize the removed soil, load the soil into trucks lined with plastic wraps, and transport the soil to the NTS for disposal as LLW. The life-cycle cost estimates are parametric estimates based on past experience on similar projects.
Completion Date Using Baseline:	FY 2014

Points of Contact (POC)

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